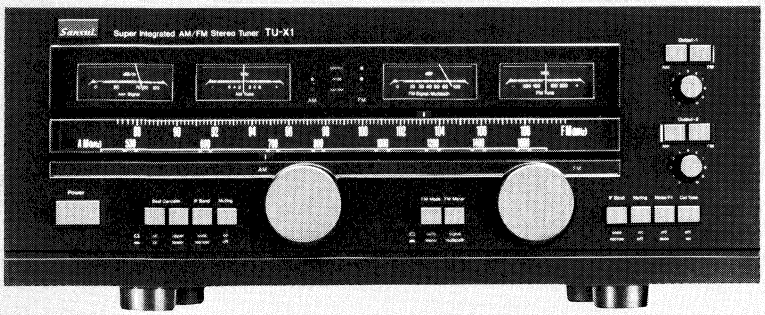
# SERVICE MANUAL

SUPER INTEGRATED AM/FM STEREO TUNER

# SANSUI TU-X1




Sansui

SANSUI ELECTRIC CO., LTD.

## SPECIFICATIONS

### FM Section

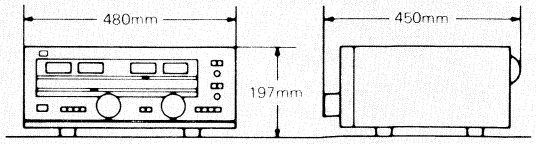
Tuning range . . . . . 88 to 108 MHz
Usable Sensitivity
  Mono IHF . . . . . 8.7 dBf (1.5 μV: T100)
  DIN . . . . . 0.9 μV
  Stereo IHF . . . . . 14.5 dBf
50 dB Quieting Sensitivity
  Mono . . . . . 12.5 dBf
  Stereo . . . . . 34.0 dBf
Signal to noise ratio at 85 dBf
  Mono . . . . . 86 dB
  Stereo . . . . . 83 dB
Distortion at 65 dBf
  Mono . . . . . less than 0.03 % at 100 Hz
  less than 0.02 % at 1,000 Hz
  less than 0.04 % at 6,000 Hz
  Stereo . . . . . less than 0.04 % at 100 Hz
  less than 0.03 % at 1,000 Hz
  less than 0.05 % at 6,000 Hz
Alternate channel selectivity (at 400 kHz)
  WIDE . . . . . 55 dB
  NARROW . . . . . 80 dB
Capture ratio . . . . . 0.9 dB
Image response ratio . . 130 dB (at 98 MHz)
Spurious response ratio
  . . . . . 130 dB (at 98 MHz)
Stereo separation . . . . 45 dB at 1,000 Hz
  50 dB at 1,000 Hz
  35 dB at 10,000 Hz
Frequency response Stereo
  . . . . . 20 to 15,000 Hz
  +0.2 dB, −0.8 dB
Antenna input impedance
  . . . . . 300 ohms balanced
  75 ohms unbalanced

### AM Section

Tuning range . . . . . 530 to 1,600 kHz
Usable sensitivity (bar antenna)
  NARROW . . . . . 50 dB/m
Selectivity
  NARROW (±9 kHz)
  . . . . . 35 dB
Signal to noise ratio . . 65 dB
Distortion (at 30 % Modulation, 90 dB/m)
  . . . . . less than 0.2 %
Image response ratio . . 65 dB at 1,000 Hz
IF response ratio . . . . 70 dB at 1,000 Hz
Frequency response . . 40 to 7,000 Hz
  +0 dB, −3.0 dB

### Others

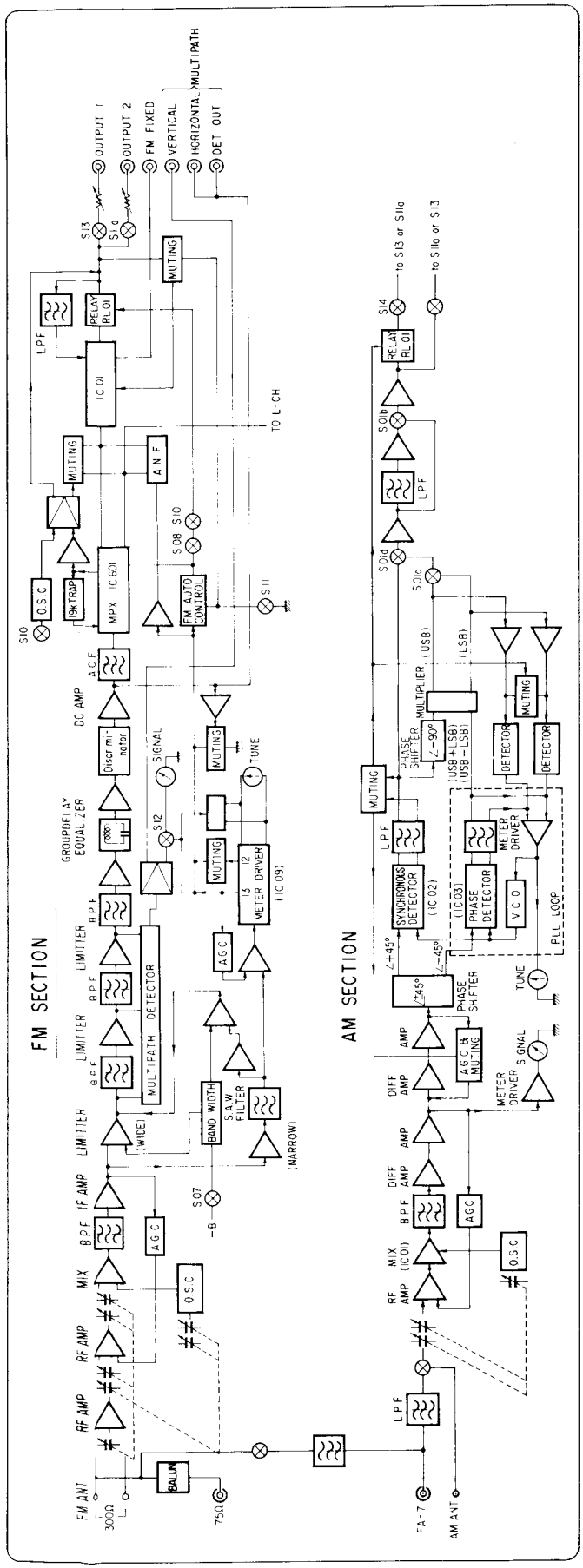
Output voltage and impedance
  OUTPUT . . . . . 0 to 1.2 V/2.5 kilohms
  FM OUTPUT . . . . 200 mV
Power requirements . . 100, 120, 220, 240 V 50/60 Hz
  For U.S.A. and Canada
  . . . . . 120 V (60 Hz)
Power consumption . . 30 W




Weight . . . . . 16.2 kg (35.7 lbs) net
18.7 kg (41.2 lbs) packed

* Design and specifications subject to changes without notice for improvements.
* In order to simplify the explanation illustrations may sometimes differ from the originals.

# 1. BLOCK DIAGRAM




# 2. OPERATION

TU-X1 employs PLL synchronized product detector in AM section and group delay equalizer, band-width selector using SAW filter, and wide-range power ratio detector in FM section to improve S/N ratio and distortion.

## ♦ AM section

The broadcast signal from antenna is applied to RF amp (FET 01) and mixed with OSC signal at IC02, then becomes 455 kHz IF signal after passing through T02. After amplified by the differential amp next to T02, one of the IF signal is fed to RF amp at first stage as an AGC signal to control the gain through D01 D02, the voltage doubler.

The other IF signal is branched and one is applied to signal meter, and the other is supplied to phase shifter composed of R62, VR07, R63, R64, and C36.

The IF signal to phase shifter is also devided into a signal toward PLL synchronized product detector, and a signal to TR08, 09 after amplified by TR07.

The signal through TR08, 09 is applied to photo-coupler (PC01) and controls feed-back amount from TR07 to the differential amp composed of TR05, 06 as AGC function by photo-coupler.

By the phase-shifter, $\pi/4$ advancing signal than IF signal is applied to pin 4 of IC02, and $\pi/4$ lagging signal to pin 4 of IC03, where the function of IC02 is synchronized detector to detect IF signal, and IC03 is phase detector to obtain VCO signal sinchronized with IF signal necessary for synchronized detection and constitutes PLL-loop with VCO composed of TR14, 11, 12. The signal input to pin 4 of IC02 is output from pin 12 as AF signal after synchronously detected.

### 1. AM PLL SYNCHRONIZED PRODUCT DETECTION

As shown in Fig. 2-1 (a), the spectrum of AM signal is composed of upper & lower side-bands to be centered on the carrier "fc".

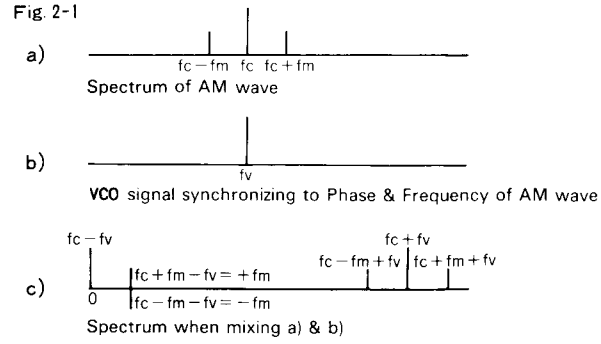
The side-bands locate further from carrier "fc" if modurating frequency becomes higher. Supposing carrier frequency "fc" as IF frequency 455 kHz, and generating a signal with the same frequency & phase as IF signal, the result of IF signal mixed with VCO signal is as follow.

Generally, when a signal with frequency "fo" is mixed with a certain frequency signal "$f_1$", signals "$f_0 \pm f_1$" appear resultly. Therefore when mixing IF signal "fc ±fm" [Fig. 2-1 (a)] with VCO signal [Fig. 2-1 (b)] synchronized to the IF signal, AM signal centering "fc + fm (= 2fc)" with side-bands ±fm, and +fm (upper side-band), −fm (lower side-band) will appear as shown in Fig. 2-1 (c).

In conclusion, if "+fm" or "−fm" is taken out somehow, the modulating signal (Audio signal) will have been reproduced.

Further, PLL synchronized product detection allows AM reception of wide range without interference because it is not necessary to pick out the desired frequency by BPF at IF stage as conventional emveloop detection.

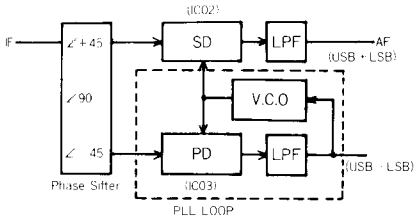
Fig. 2-1




### 2. AM SYNCHRONIZED DETECTION & PLL

For synchronized detection of AM signal, it is required to mix a signal having the same frequency & phase with AM signal that TU-

X1 employs PLL circuit to obtain the signal synchronized with IF signal.




## • Operation of LM 1496N

Fig. 2-3 shows the internal circuit of LM 1496N used for AM synchronized detector & phase detector.

When IF signal is applied to pin 4 and VCO signals to pin 8, 10 in antipase, the signal at point "a" is (pin 4) x (pin 8) and point "b" (pin 4) x (pin 10). For AM synchronized detection, IF signal "$e_1$" (the input signal of IC02 pin 4) is expressed as follow:

$$e_1 = E_1 (1 - K \cos \omega_m t) \cos \omega_c t$$

$$= E_1 \cos \omega_c t - \frac{1}{2} E_1 K \cos (\omega_c + \omega_m) t - \frac{1}{2} E_1 K \cos (\omega_c - \omega_m) t$$

where: $E_1$ : amplitude of carrier

$\omega_c$ : angular frequency of IF carrier

$K$ : moduration factor

$\omega_m$ : angular frequency of moduration signal

and supposing VCO signal "$e_2$" applied to pin 8 of IC02 as follow:

$$e_2 = -E_2 \cos \omega_v t$$

where: $E_2$ : amplitude of VCO signal

$\omega_v$ : angular frequency of VCO signal

the output of pin 12 after passing through the low-pass filter becomes as below:

$$\text{pin 12 (SDout)} = -\frac{1}{2} E_1 E_2 \cos (\omega_c - \omega_v) t + \frac{1}{4} E_1 E_2 K \cos (\omega_c - \omega_v + \omega_m) t + \frac{1}{4} E_1 E_2 K \cos (\omega_c - \omega_v - \omega_m) t$$

As the VCO frequency $\omega_v$ is synchronized to IF carrier frequency fc, that $\omega_v = \omega_c$, the equation above becomes followingly:

$$\text{pin 12 (SDout)} = -\frac{1}{2} E_1 E_2 + \frac{1}{4} E_1 E_2 K \cos \omega_m t \ \boxed{\text{USB}} + \frac{1}{4} E_1 E_2 K \cos (-\omega_m) t \ \boxed{\text{LSB}}$$

The equation above indicates the output of synchronized detector is the AF signal of upper side-band [USB] + lower side-band [LSB]

On the other hand, for the PLL phase detector, $\pi/2$ (90°) lagging signal than input signal of IC02 is applied to pin 4 of IC03. Therefore, supposing input signal '$e_1$' of IC03 pin 4 as below:

$$e_1' = E_1 (1 + K \cos \omega_m t) \cos (\omega_c t - 90°)$$

$$= E_1 \sin \omega_c t - \frac{1}{2} E_1 K \sin (\omega_c + \omega_m) t - \frac{1}{2} E_1 K \sin (\omega_c - \omega_m) t$$

the output signal from pin 12 of IC03 after low pass filter is as follow:

$$\text{pin 12 (PDout)} = -\frac{1}{2} E_1 E_2 \sin (\omega_c - \omega_v) t + \frac{1}{4} E_1 E_2 K \sin (\omega_c + \omega_m - \omega_v) t + \frac{1}{4} E_1 E_2 K \sin (\omega_c - \omega_m - \omega_v) t$$

$$= \frac{1}{4} E_1 E_2 \sin \omega_m t \ \boxed{\text{USB}} - \frac{1}{4} E_1 E_2 K \sin \omega_m t \ \boxed{\text{LSB}}$$

The output of phase detector is upper side-band (USB) – lower side-band (LSB), and while PLL is locked with carrier frequency to receive FM broadcast, the output of phase detector is 0.

Fig. 2-4, 2-5 show the input & output waveforms of synchronized detector & phase detector. In Fig. 2-4 (synchronized detector), full-wave rectified output (c) is obtained to switch AM IF signal (a) by VCO signal (b).

When full-wave rectified output is applied to integrator circuit, the output becomes emvelope of (c), AF signal.

Fig. 2-3 LM1496N

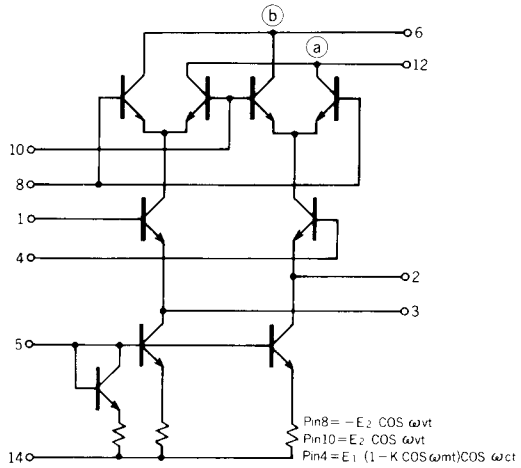



Fig. 2-4

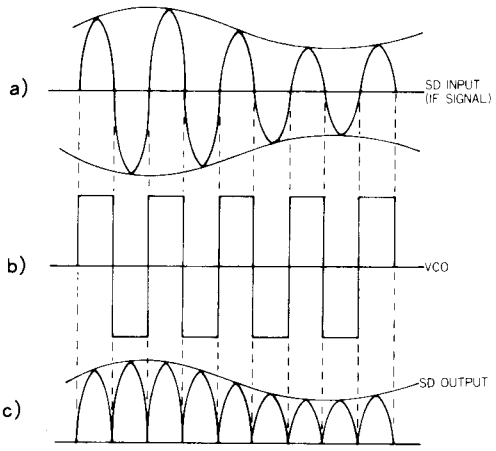
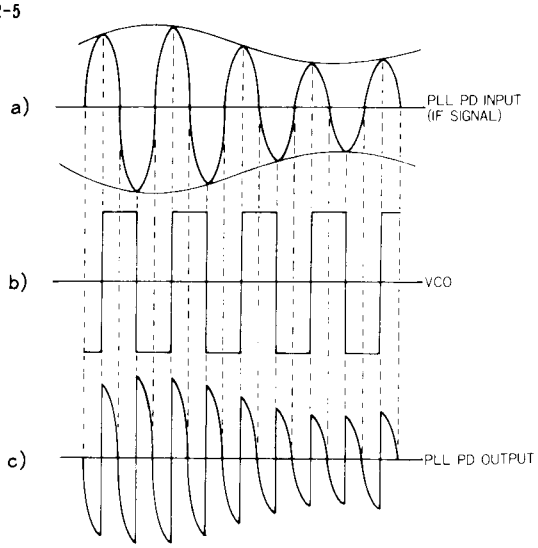



Fig. 2-5



## 3. BEAT CANCELLER CIRCUIT

When the broadcast desired is interfared as Fig. 2-6, the signal appeared with beat sound from speaker. In order to eliminate such a interference, TU-X1 provides beat canceller circuit composed of TR24, 25, 26.

As shown in Fig. 2-6, if the upper side-band of desired broadcast is interfared the interfared component can be cancelled to pick up upper or lower side-band only because the same components are included in AM broadcast signal of upper & lower side-bands. In the detector stage of TU-X1, the respective output of synchronized detector is upper side-band + lower side-band, and PLL phase detector upper side-band − lower side-band.

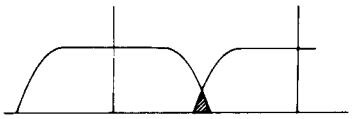
Therefore, combining the outputs of PLL phase detector & synchronized one to add or subtract as follow,

Synchronized detector output (USB + LSB)
+ PLL phase detector output (USB − LSB) = 2 (USB)

Synchronized detector output (USB + LSB)
− PLL phase detector output (USB − LSB) = 2 (LSB)

the output of beat canceller can be picked out USB or LSB only as above, which allows high quality AM reception without interference.

Fig. 2-6



### ♦ FM Section

FM broadcast signal is mixed with OSC signal at FET03 after amplified RF stage, the couple of amplifier, and is output from IF amp of TR02 as 10.7 MHz IF signal to pass through wide band BPF.

IF signal is branched and one becomes AGC signal to be rectified by means of voltage doublar. The other is applied to SAW filter if IF band selector to be narrow and band selector being wide the signal passes through a limiter amp, then supplied to IF BPF.

The multipass component of IF signal is detected while IF signal is passing through the limitter amps and BPFs. IF signal passed through is applied to group delay equalizer, then wide band ratio detector.

AF composit signal output of ratio detector is amplified by high-slew rate DC amp then through ACF (Adjacent Channel Filter) to MPX circuit.

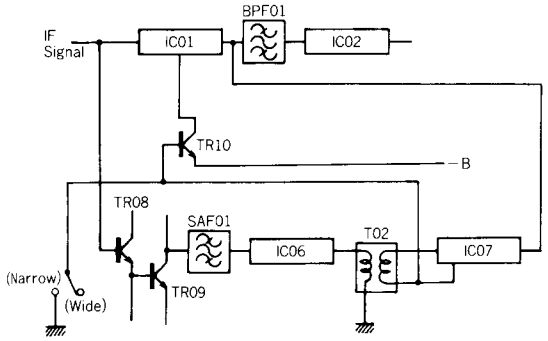
## 1. FM IF BAND SELECTOR & SAW FILTER (See Fig. 2-7)

IF band selector being wide, the selectivity is 55 dB at 400 Hz detuning by using LC block filter, and it being narrow, the selectivity over 80 dB can be obtained to be added a SAW filter.

The band width selection is performed by IF band selector and TR10. While IF band selector being wide, the bias voltage added to input pin 5, 7 of IC07 is cut off (the same voltage of $-V_{CC}$) that IF signal applied to pin No. 7 of IC01 is amplified and output from pin No. 2.

The selector being narrow, the bias to pin 5, 7 of IC07 is normal that IF signal is amplified then output from pin No. 1 of IC07. On the other hand, TR10 turns on and bias added to input terminal of IC01 is cut off voltage that wide circuit becomes not to function.

Fig. 2-7




## 2. SAW Filter (Surface Accoustic Wave Filter)

The characteristic desired for the filter used in FM IF stage is:

1) to have high selectivity.

2) to have linear phase characteristic (group delay characteristic)

The ceramic filter has a high selectivity, and LC block filter provides linear phase characteristic, which are conventionaly used, however they are utilizing resonance that to design phase and amplitude characteristic independently is hardly achieved.

The SAW filter, it is idealy possible to design phase and amplitude characteristic independently because the propergation verosity of surface accoustic wave being constant regardless of signal frequency, therefore the filter to meet with the characteristic for FM IF stage is realizable.

The configuration of SAW filter is Interdigital Transducer (comb-like electrode) photo-etched on the piezoelectric element such as ceramic & ZnO as shown in Fig. 2-8 a) b) c).

Generally, when inpulse is applied to Interdigital Transducer (IDT), the mechanical strain produced between adjacent electrodes by the piezoelectric effect, surface accoustic wave propagates toward the rectangular direction against IDT as shown in Fig. 2-8 a).

The function of piezoelectric element is to transform electric signal to surface wave of accoustic signal, or inversed function.

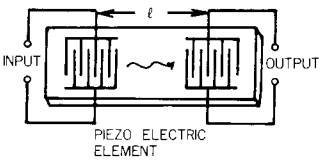
When using surface wave for filters, IDTs for both transmission and reception are necessary as shown in Fig. 2-8 (c). Supposing electrical signal applied to IDT for transmission, the center frequency $f_0$ is determined by pitch $\lambda_0$ of IDT and verosity V of surface wave propergating on substrate, and the relation between them is indicated by equation below.

$$f_0 = V/\lambda_0$$

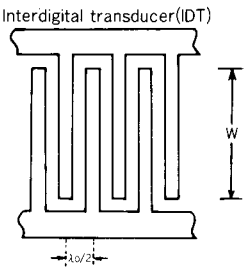
In addition, the band width of filter is inversely proportional to the pitch $\lambda_0$ and amount of electrode pair N of IDT, and phase characteristic is defined by the distance between the IDT for transmission & reception.

Fig. 2-8

a)




b)




c)

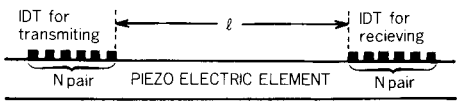
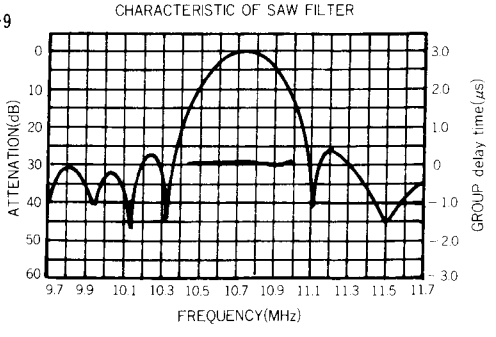



Fig. 2-9



## 3. Multipath interference & Multipath Meter circuit

Multipath interference is occurred when direct wave from FM station and reflected wave by buildings or mountains are received simultaneously and interference between them are occurred to modulate direct wave in amplitude and phase by reflected wave because of time delay of reflected wave.

The AM component can be eliminated by limiter amp, however, PM component appears as distortion factor. Thereby when multipath distortion is occurred, it is recommended to use a beam antenna to aim the direction that the indication of Multipath Meter becomes minimum.

- **Multipath Meter circuit (see Fig. 2-12)**

The function of Multipath Meter circuit is to detect AM component caused by multipath interfernece, then indicate the amount multipath interference by the multipath meter or oscilloscope.

As shown in Fig. 2-12, the circuit is 4 stage type detection that it is possible to detect the amount of multipath interference precisely.

Fig. 2-12

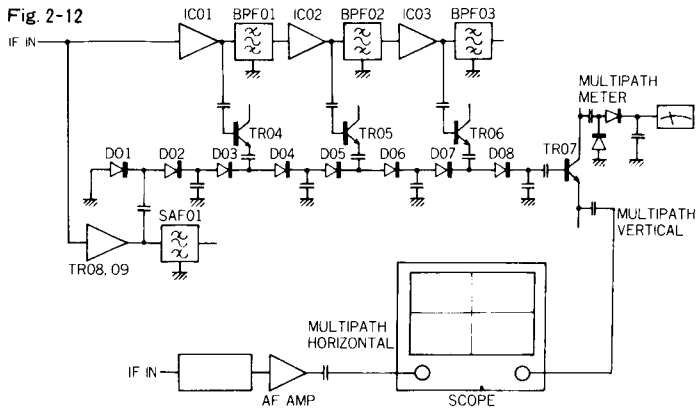



Fig. 2-10

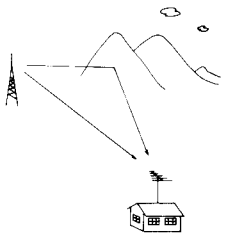
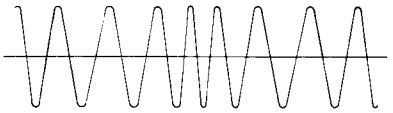


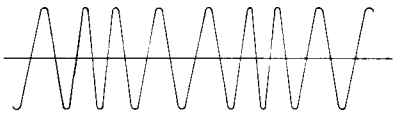
Fig. 2-11

1) Modurating wave-form(Audio Signal)

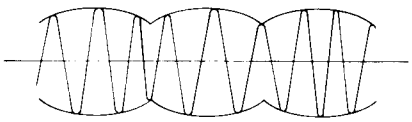
2) Direct wave



3) Refrected wave



4) Direct wave+Refrected wave(FM wave with Multipath)

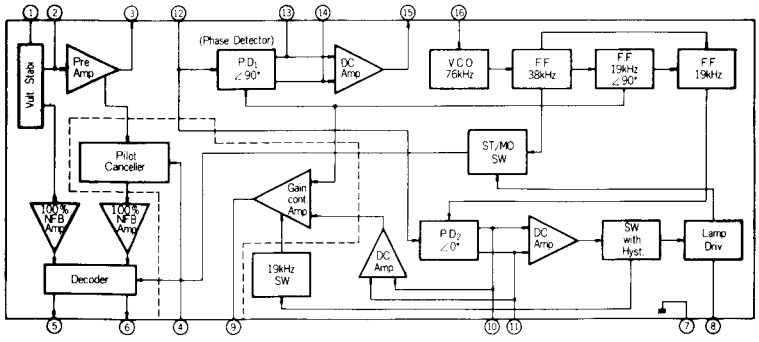


5) AM Component occured by Direct wave+ Refrected wave

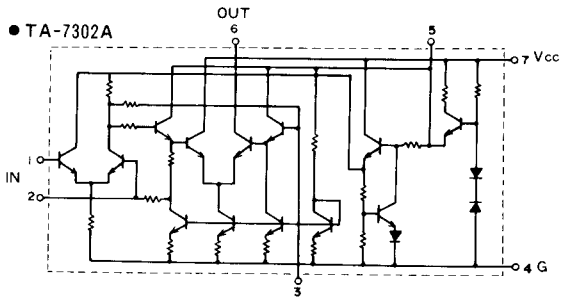
6) Distorted Audio output caused by PM component occured by Direct+Refrected wave

## ◆Internal Block Diagram of ICs

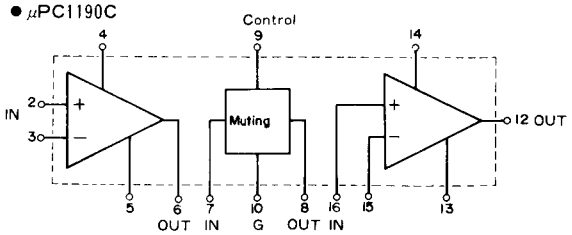
● HA11223



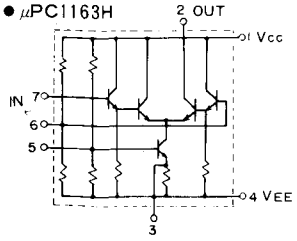

● TA-7302A



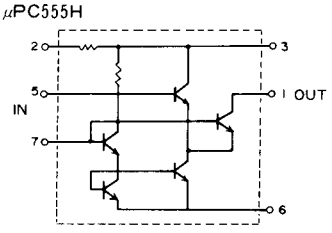

● μPC1190C



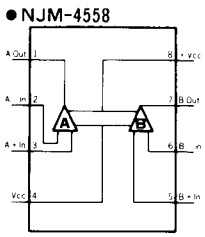

● μPC1163H



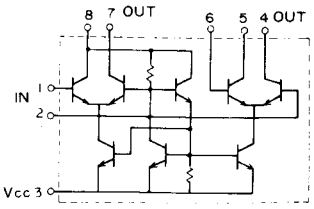

● μPC555H




● NJM-4558




● LA-1222



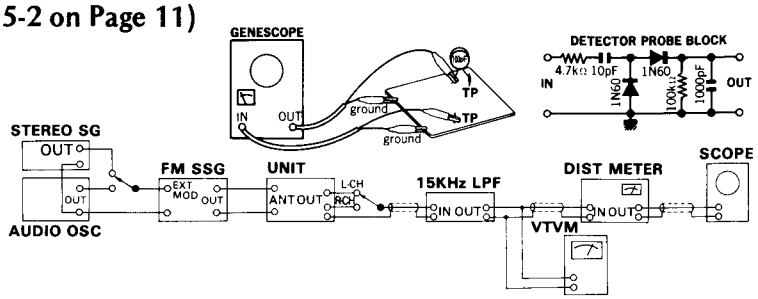
# 3. ADJUSTMENT (See PHOTOS 5-1, 5-2 on Page 11)

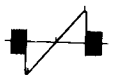
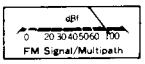
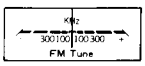
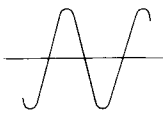
## 3-1. FM ADJUSTMENT

### 1) FM, IF, RF Adjustment

**Note:**

1. Selector . . . . FM MONO
2. Connection . . Connect the output of genescope to TP02 F-2936 through 100 pF ceramic capacitor.




| STEP | SUBJECT | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | IF Coil, Group Delay Adj. (In case of using Genescope) | Genescope Output 95 dB | TP02 F-2935 | TP02 F-2936 Use Detector Probe | T01, T02, T03, T04 (F-2935) T01, TC01 (F-2935) | Max wave-form Make the maker position symmetrical | IF BAND WIDTH →WIDE |
| | | Same as above | Same as above | Same as above | T02 (F-2936) | Make wave-form the same hight at step 1 Make the maker position symmetrical | IF BAND WIDTH →NARROW |
| 2. | Discriminator Coil Adj. (In case of using Genescope) | No Input | | TP02 F-2937 DC Volt Meter | T03 (F-2937) | DC 0.1 V ~ 0.15V | |
| | | Genescope Output 90 dB | TP02 F-2935 | TP02 F-2937 | T01, T02, T03 (F-2937) | Make steep linear S curve Make the serve symmetrical |  |
| 3. | IF Coil, Group Delay, Discriminator coil Adj. (In case of using Dist Meter) | 90 MHz ANT Input 65 dBf (59.8 dB) 1000 Hz (100% MOD) FM SSG | ANT terminal 300Ω | Output Terminal L-CH or R-CH Connect VTVM Scope, Dist Meter | T01, T02, T03 T04 (F-2935) T01, T02 TC01 (F-2936) T01, T02, T03 (F-2937) | Mini Distortion | Adjust to set IF BAND WIDTH to be WIDE at first, then adjust T02 on F-2936 to set IF BAND WIDTH to be Narrow (See Note on P6) |
| 4. | FET Bias Adj. | No Input | | Voltage between earth & source of FET02, 03 on F-2935 DC Volt Meter | VR01 (FET02) VR02 (FET03) (F-2935) | DC 1V | |
| 5. | Signal Meter Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) 1000 Hz (100% MOD) FM SSG | ANT terminal 300Ω | Signal Meter | T03, T04 (F-2936) | Max. indication on Signal Meter |  |
| | | 90 MHz ANT Input 100 dBf (94.8 dB) 1000 Hz (100% MOD) FM SSG | Same as above | Same as above | VR01 (F-2936) | Make the indication of signal meter 100 dBf | |
| 6. | Tune Meter Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) 1000 Hz (100% MOD) FM SSG | Same as above | Tune Meter | T05 (F-2936) | Center Position on Tune Meter |  |
| | | No Input | | Same as above | VR02 (F-2936) | Same as above | |
| 7. | RF Sensitivity Adj. | 90 MHz ANT Input 20 dBf (14.8 dB) 1000 Hz (100% MOD) FM SSG | ANT terminal 300Ω | Signal Meter OUTPUT Terminal L-CH or R-CH connect VTVM & Scope | L01, L02, L03, L04 L05, TC01 TC02, TC03, TC04, TC05 (F-2935) | Max. indication of VTVM Scope Signal Meter | Make the sensitivity in the FM Band evenly. |
| | | 83 MHz ANT Input 20 dBf (14.8 dB) 1000 Hz (100% MOD) FM SSG | Same as above | Same as above | L01, L02, L03, L04, L05 (F-2935) | Same as above |  |
| | | 98 MHz ANT Input 20 dBf (14.8 dB) 1000 Hz (100% MOD) FM SSG | Same as above | Same as above | TC01, TC02, TC03 TC04, TC05 (F-2935) | Same as above | |

## 2) FM Stereo Adjustment

Note: 1. Selector . . . . . FM AUTO

| STEP | SUBJECT | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | MPX VCO Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) FM SSG Pilot 19 kHz (9% MOD) Sub 1kHz + Pilot (100% MOD) Stereo SG | ANT terminal 300Ω | STEREO Indicator | VR01 F-2972 | Make STEREO Indicator luminous | Center Position of lighting range. |
| | MPX VCO Adj. (Use Freq. counter) | 90 MHz ANT Input 65 dBf (59.8 dB) FM SSG (No MOD) | Same as above | TP01 F-2972 Connect freq. counter | VR01 F-2972 | 76 kHz ± 76 kHz | |
| 2. | MUTING Adj. | 90 MHz ANT Input 18 dBf (12.8 dB) FM SSG | Same as above | STEREO Indicator | VR03 F-2972 | 18 dBf | STEREO indicator turns on above 18 dBf input & turns off below 18 dBf input. |
| 3. | PILOT CANCELL Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) FM SSG Pilot 19 kHz (9% MOD) Stereo SG | Same as above | OUTPUT terminal L-CH or R-CH connect VTVM Scope | VR02, T01 F-2972 | Minimum output | |
| 4. | Separation Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) FM SSG Pilot 19 kHz (9% MOD) L-CH 1 kHz + Pilot (100% MOD) Stereo SG | Same as above | OUTPUT terminal L-CH connect VTVM Scope | | Read the indication on VTVM | |
| | | Same as above | Same as above | OUTPUT terminal R-CH connect VTVM Scope | VR06 F-2972 | −50 dB from the indication above. | Confirm R → L-ch |
| 5. | Auto Noise Filter Adj. | 90 MHz ANT Input 40 dB (34.8 dB) FM SSG Pilot 19 kHz (9% MOD) Sub 1 kHz + Pilot (100% MOD) Stereo SG | Same as above | OUTPUT terminal L-CH or R-CH connect VTVM Scope | | Read the indication on VTVM | Noise Filter Switch → AUTO |
| | | 90 MHz ANT Input 40 dBf (34.8 dB) FM SSG Pilot 19 kHz (9% MOD) Sub 10 kHz + Pilot (100% MOD) Stereo SG | Same as above | Same as above | VR04 F-2972 | −3 dB from the indication above | |
| 6. | Calibration Adj. | 90 MHz ANT Input 65 dBf (59.8 dB) 1000 Hz (100% MOD) FM SSG | Same as above | Same as above | | Read the indication on VTVM | |
| | | | | Same as above | VR05 F-2972 | −5 dB from the indication above. | Calibration Switch → ON |

**Note:**
In the adjustment using Dist Meter, the equipments with following accuracy are required.

1. FM SSG . . . . . Distortion: Less than 0.1 %
   S/N ratio: More than 90 dB
2. Stereo SG . . . . . Distortion: Less than 0.1 %
   S/N ratio: More than 90 dB
3. Dist Meter . . . . . Providing 0.1% full-scale range

### •Abbreviations

Equipment

| | |
|---|---|
| AM FM Generator Oscilloscope | Genescope |
| AM Standard Signal Generator | AM SSG |
| FM Standard Signal Generator | FM SSG |
| FM Stereo Generator | Stereo SG |
| Oscilloscope | Scope |
| Audio Oscillator | Audio Osc. |
| Distortion Meter | Dist. Meter |

Others

| | |
|---|---|
| Antenna | ANT. |
| Modulation | MOD. |
| Total Harmonic Distortion | T.H.D. |

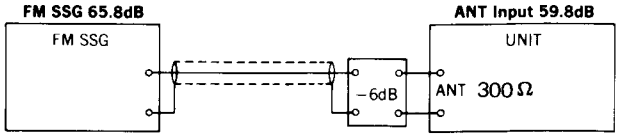
### • NEW MEASUREMENT FOR FM.

Input signal level under the provision of IHFM-T-200, a new measurement method is indicated by available power ratio "dBf" To obtain approximate available power ratio "dBf", abstract 0.8 from attenuater indication of general FMSG (open load indication type); however, the former measurement, IHFM-T-100 is designated together too.

The way of modulation of IHFM-T-200 is shown below.

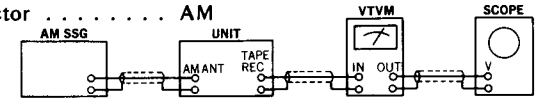
| | modulation frequency | modulation mode | modulation factor |
|---|---|---|---|
| FM MONO | 1000 Hz | | 100% |
| FM STEREO | 1000 Hz | SUB | Pilot 9%<br>Pilot + SUB 100% |

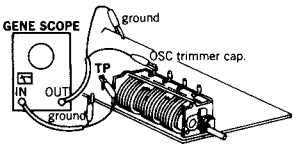
- The relation between the standard input 65 dBf of IHFM-T-200 and the former indication "dB" is shown below.



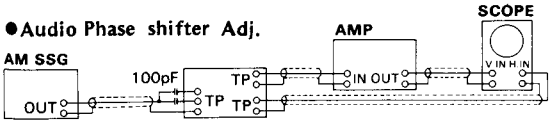
## 3-2. AM IF Adjustment & Dial Calibration

Note: 1. Selector . . . . . AM

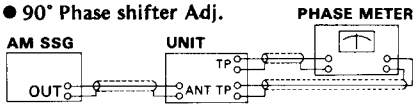


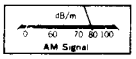
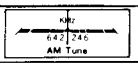
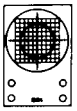
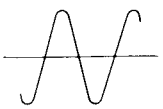




● Audio Phase shifter Adj.




● 90° Phase shifter Adj.



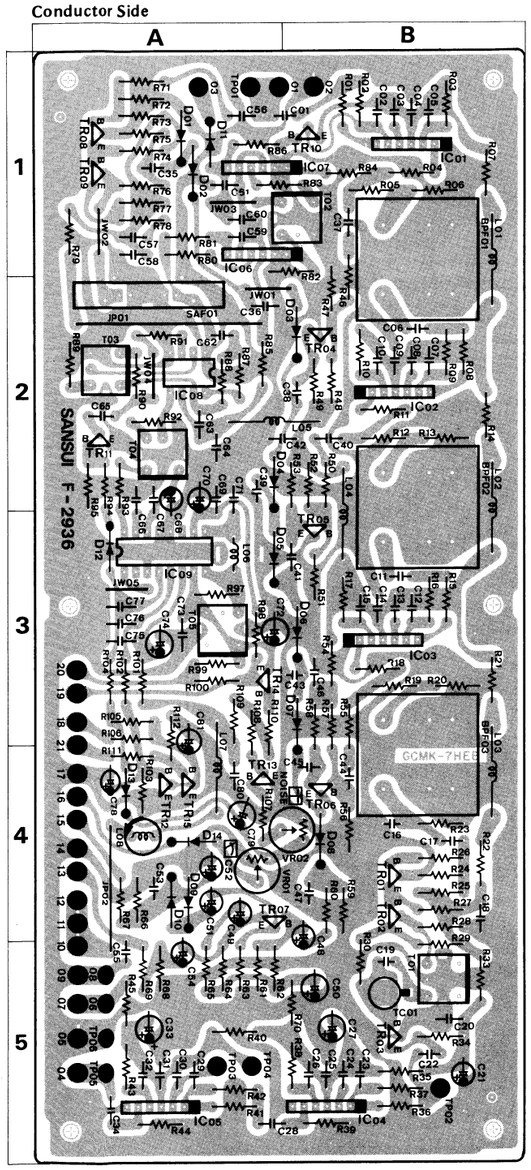

| STEP | SUBJECT | FEED SIGNAL FROM | FEED SIGNAL TO | MEASURE OUTPUT | ADJUST | ADJUST FOR | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | IF Coil Adj. | Genescope Output 90 dB | TP03 F-2783 | TP10 F-2783 | T02 F-2783 | Max. wave-form Make the Marker Position symmetrical | |
| 2. | AGC Adj. | AM SG Output 90 dB 1 kHz (30% MOD) | ANT terminal | TP10 F-2783 Connect VTVM | VR01 F-2783 | 160 mV | |
| 3. | Signal Meter Adj. | AM SG Output 80 dB 1 kHz (30% MOD) | Same as above | Signal Meter | VR02 F-2783 | Make the indication on Signal Meter 80 dB |  |
| 4. | Tune Meter Adj. | No Input | | Tune Meter | VR08 F-2783 | Center Position on Tune Meter |  |
| 5. | VCO Adj. | No Input | | TP12 F-2783 Connect freq. counter | T04 F-2783 | 455 kHz | |
| 6. | 90° Phase Shifter Adj. (In case of using Phase Meter) | AM SG Output 90 dB 1 kHz (30% MOD) | TP03 F-2783 | TP13, TP14 F-2783 Connect Phase Meter | VR07 F-2783 | 90° Phase difference | |
| | 90° Phase Shifter Adj. | No Input | | | VR07 F-2783 | Center Position | |
| 7. | Audio Phase Shifter Adj. | Audio OSC Output 1 kHz 2.5 V | TP06, TP07 F-2783 | TP08, TP09 F-2783 Make lissajous figure | VR03 F-2783 | 90° Phase difference |  Make lissajous figure circle |
| | | Audio OSC Output 9 kHz 2.5 V | Same as above | | VR04 F-2783 | 90° Phase difference | |
| 8. | Beat Canceller Adj. | The nearest AM broadcast | | Tune Meter | Tuning Knob | The broadcasting frequency | |
| | | AM SG Output −10 dB than the broadcast on Signal Meter and +4 kHz than the broadcast | ANT terminal | OUTPUT terminal Connect AMP Speaker | VR05 F-2783 | Minimum beat sound | Beat Canceller Switch → ON, lower |
| 9. | Muting Adj. | AM SG Output 40 dB 1 kHz (30% MOD) | Same as above | OUTPUT terminal Connect VTVM Scope | VR06 F-2983 | Make the output not appearing | MUTING switch → ON OUTPUT appears when AM SG OUTPUT becomes above 40 dB |
| 10. | Dial Calibration Adj. | 600 kHz AM SG Output 60 dB 1 kHz (30% MOD) | Same as above | Tune Meter | T01 F-2783 | Make the indication on Tune Meter Center | |
| | | 1400 kHz AM SG Output 60 dB 1 kHz (30% MOD) | Same as above | Same as above | TC03 F-2783 | Same as above | |
| 11. | Sensitivity Adj. | 600 kHz AM SG Output 60 dB 1 kHz (30% MOD) | Same as above | OUTPUT terminal Connect VTVM Scope | L01 (Bar Antenna) T03 F-2925 | Max. OUTPUT | |
| | | 1400 kHz AM SG Output 60 dB 1 kHz (30% MOD) | Same as above | Same as above | TC02 F-2925 VC701 | Same as above |  |
| | | 600 kHz AM SG Output 60 dB 1 kHz (30% MOD) | FA-7 terminal | Same as above | T02 F-2925 | Same as above | |
| | | 1400 kHz AM SG Output 60 dB 1 kHz (30% MOD) | Same as above | Same as above | TC01 F-2925 | Same as above | |

# 4. PARTS LOCATION & PARTS LIST

- Since some of capacitors and resistors are omitted from parts lists in this Service Manual, refer to the Common Parts List for capacitors & resistors which was appended previously to each Sansui Manual.

## 4-1. F-2936 FM IF Circuit Board (Stock No. 7522071)

Conductor Side

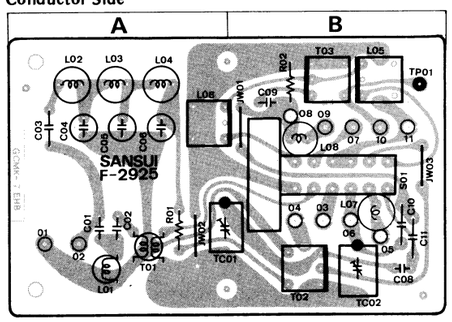



Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| •Transistors | | | |
| TR01 ~ 06 | 0306241, 2 | 2SC1675 L, K | 2,3,4,5B |
| TR07 | 0305951 ~ 3 | 2SC945 Q, P, K | 4A |
| TR08, 09 | 0306241, 2 | 2SC1675 L, K | 1A |
| TR10 ~ 15 | 0305951 ~ 3 | 2SC945 Q, P, K | 1B,2,3,4A |
| IC 01 ~ 03 | 0360540 | IC μPC 1163H | 1,2,3B |
| IC 04, 05 | 0360590 | IC TA-7302P | 5B,5A |
| IC 06, 07 | 0360120 | IC μPC555H | 1A |
| IC 08 | 0360510 | IC LA-1222 | 2A |
| IC 09 | 0360350 | IC HA1137W | 3A |
| •Diodes | | | |
| D 01 ~ 10 | 0310330, 1 | 1N60 | 1,2,3,4A,2,3,4B |
| D 11, 12 | 0340170 | MV-103 | 1A,3A |
| D 13 | 0340150 | MV-12 | 4A |
| D 14 | 0340170 | MV-103 | 4A |
| C 19 | 0669502 | 2pF 50V C.C. | 5B |
| L 01 ~ 05 | 4290011 | Peaking Coil | 1,2,3,4B |
| L 06 | 4290300 | 18μH Inductor | 3A |
| L 07 | 4290011 | Peaking Coil | 4A |
| L 08 | 4900340 | 10μH Inductor | 4A |
| T 01 | 4236130 | IF Coil | 5B |
| T 02 | 4235860 | FM IF Coil | 1B |
| T 03, 04 | 4235930 | IF Coil | 2A |
| T 05 | 4236040 | IF Coil | 3A |
| BF01 ~ 03 | 4236070 | FM IF Coil | 1,2,3B |
| VR01 | 1035130 | Volume 10kΩ B FM, S Meter | 4A |
| VR02 | 1035190 | Volume 100kΩ B Noise | 4B |
| TC01 | 1230090 | Trimmer Capacitor | 5B |
| SF01 | 0910470 | SAW Filter | |

## 4-2. F-2925 Antenna Selector Circuit Board (Stock No. 7597291)

Conductor Side

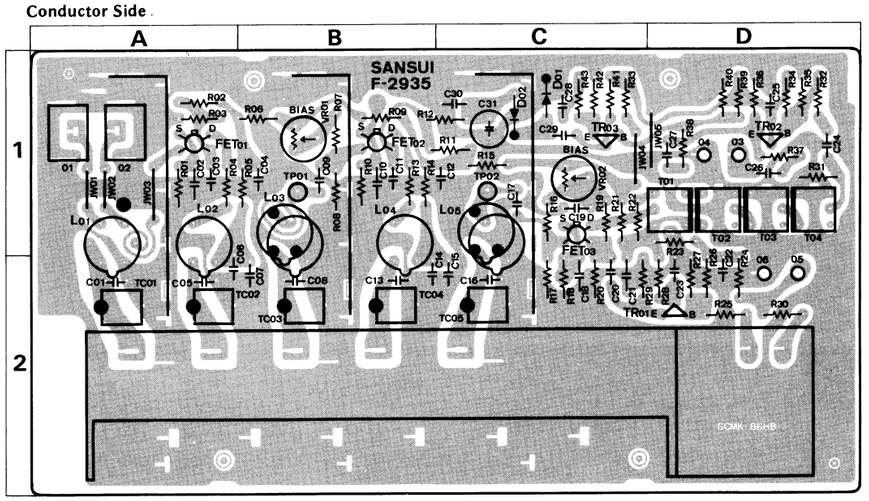



Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| C 01, 02 | 0661270 | 27pF 50V C.C. | A |
| C 04, 05 | 0621222 | 2200pF 50V P.C. | A |
| C 06 | 0621332 | 3300pF 50V P.C. | A |
| C 10 | 0679008 | 1.0pF 500V Gimmic Capacitor | B |
| C 11 | 0679024 | 0.33pF 500V Gimmic Capacitor | B |
| L 01 | 4290380 | 0.13μH Choke Coil | A |
| L 02 | 4900280 | 1.0μH Inductor | A |
| L 03, 04 | 4900470 | 8.2μH | A |
| L 05, 06 | 4290350 | 240μH Choke Coil | B,A |
| L 07, 08 | 4900140 | Inductor | B |
| T 01 | 4290390 | FM Coil | A |
| T 02 | 4200940 | AM ANT Coil | B |
| T 03 | 4210390 | AM RF Coil | B |
| S 01 | 1131730 | Push Switch | B |
| TC01, 02 | 1230100 | Trimmer Capacitor | A,B |

## 4-3. F-2935 Front-end Circuit Board (Stock No. 7510741)

Conductor Side

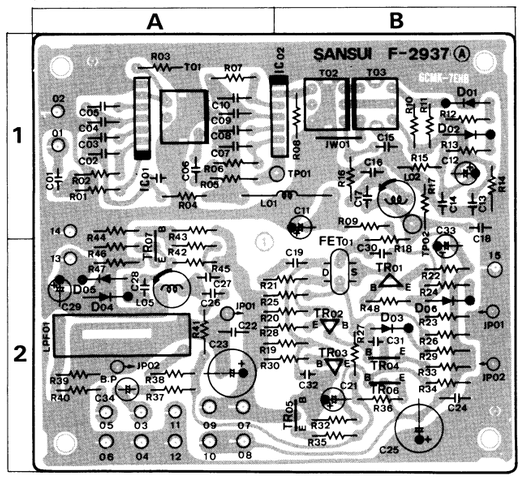



Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| •Transistors | | | |
| TR01 ~ 03 | 0306341, 2 | 2SC1674 L, K | 1C,B,2D |
| •FET | | | |
| FET01 ~ 03 | 0370130, 1 | 3SK41 (I) M, L | 1A,B,C |
| •Diodes | | | |
| D 01, 02 | 0311160 | 1S2473D | 1C |
| | 0311180 | 1S1588 | |
| C 01 | 0669527 | 7pF 50V C.C. | 2A |
| C 05 | 0669306 | 22pF 50V C.C. | 2A |
| C 08 | 0669305 | 20pF 50V C.C. | 1B |
| C 13 | 0669306 | 22pF 50V C.C. | 2B |
| C 16 | 0669305 | 20pF 50V C.C. | 2C |
| L 01 | 4200920 | FM Antenna Coil | 1A |
| L 02 ~ 05 | 4210380 | FM RF Coil | 1A,B,C |
| T 01 | 4236090 | IF Coil | 1D |
| T 02 | 4236100 | IF Coil | 1D |
| T 03 | 4236110 | IF Coil | 1D |
| T 04 | 4236120 | IF Coil | 1D |
| VR01 | 1035250 | Volume 1MΩ B RF Bias | 1B |
| VR02 | 1035230 | Volume 470kΩ B RF Bias | 1C |
| VC01 | 1220290 | AM, FM Variable Capacitor | |
| TC01 ~ 05 | 1230110 | Trimmer Capacitor | 2A,B,C |

## 4-4. F-2937 Discriminator Circuit Board (Stock No. 7522081)

Conductor Side

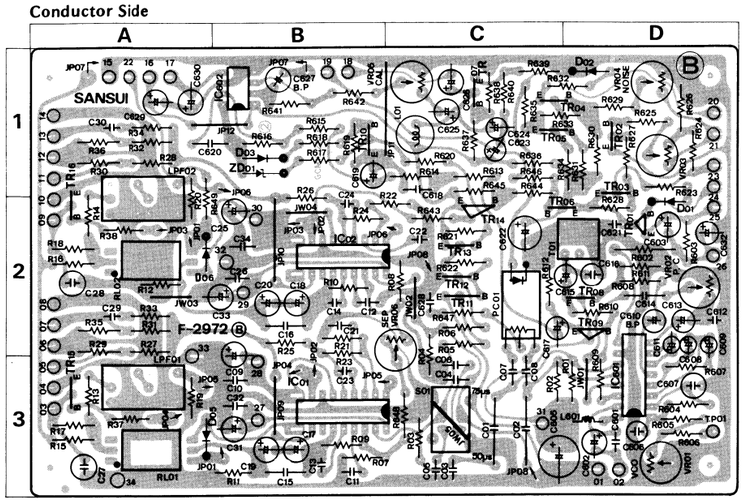



Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| •Transistors | | | |
| TR01 | 0306741 | 2SC1845 E | 2B |
| TR02, 03 | 0301091 | 2SA992 E | 2B |
| TR04, 05 | 0306741 | 2SC1845 E | 2B |
| TR06 | 0301091 | 2SA992 E | 2B |
| TR07 | 0305951 ~ 3 | 2SC945 Q, P, K | 1A |
| IC 01 | 0360590 | IC TA-7302P | 1A |
| IC 02 | 0360540 | IC μPC 1163H | 1B |
| •FET | | | |
| FET01 | 0370311, 2 | 2SK129 L, M | 1B |
| •Diodes | | | |
| D 01 ~ 03 | 0311160 | 1S2473D | 1,2B |
| D 04, 05 | 0310330, 1 | 1N60 | 2A |
| C 13, 14 | 0622221 | 220pF 125V P.C. | 1B |
| C 15, 16 | 0623101 | 100pF 125V P.C. | 1B |
| C 17 | 0623680 | 68pF 125V P.C. | 1B |
| C 18 | 0623101 | 100pF 125V P.C. | 1B |
| C 19 | 0622331 | 330pF 125V P.C. | 2B |
| C 22, 24 | 0680041 | 0.047μF 100V M.C. | 2A,2B |
| C 30 | 0623220 | 22pF 125V P.C. | |
| L 01 | 4290011 | Peaking Coil | 1B |
| L 02 | 4900310 | 3.3μH Inductor | 1B |
| L 05 | 4900460 | 1000μH Inductor | 2A |
| T 01 | 4235860 | FM IC Coil | 1A |
| T 02 | 4236140 | IF Coil | 1B |
| T 03 | 4236150 | IF Coil | 1B |
| LF01 | 0910400 | Adjacent Channel Filter | |

## 4-5. F-2972 MPX Circuit Board (Stock No. 7540871)

Conductor Side




### Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| •Transistors | | | |
| TR01 | 0305951, 2 | 2SC945 Q, P | 2A |
| TR02 | 0306740, 1 | 2SC1845 F, E | 3A |
| TR03 | 0300680, 1 | 2SA733 (2) P, Q | 3A |
| TR04 | 0306740, 1 | 2SC1845 F, E | 3A |
| TR05, 06 | 0305951, 2 | 2SC945 Q, P | 3A |
| TR07 ~ 10 | 0306740, 1 | 2SC1845 F, E | 2A, 3B |
| TR11, 12 | 0305951, 2 | 2SC945 Q, P | 2B |
| TR13, 14 | 0300680, 1 | 2SA733 (2) P, Q | 2B |

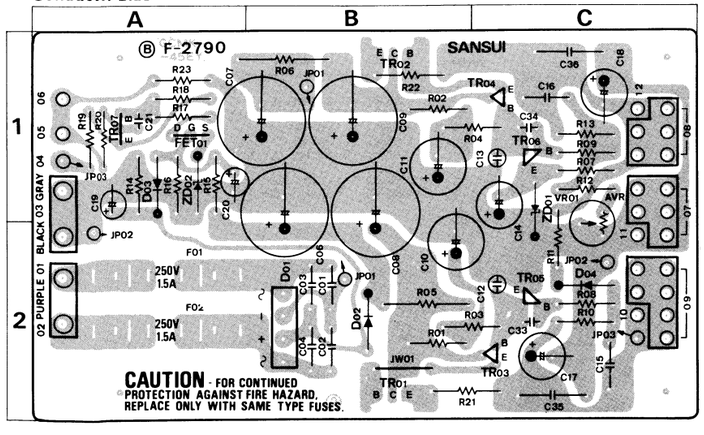
| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| IC 01, 02 | 0360810 | IC μPC-1190C | 1C, 2C |
| IC 601 | 0360680 | IC HA11223 | 1A |
| IC 602 | 0360770 | IC NJM4558D | 3C |
| •Diodes | | | |
| D 01 | 0311160 / 0311180 | 2S2473D / 1S1588 | 2A |
| D 02 | 0340150 | MV-12 Varistor | 3A |
| D 03 | 0311160 / 0311180 | 1S2473D / 1S1588 | 3C |

### Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| D 05, 06 | 0310340 | 10D1 | 1C, 2C |
| •Zener Diode | | | |
| ZD01 | 0311160 / 0311180 | RD13E B / RD13E C | 3C |
| PC | 0920080 | P873-G35-911 Photo Coupler | 2A |
| C 01, 02 | 0681001 | 0.47μF 250V M.C. | 1B |
| C 09 | 0584100 | 10μF 35V E.C. | 1B |
| C 11, 12 | 0602228 | 0.22μF 100WV | 1C, 2B |
| C 15, 16 | 0602108 | 0.1μF 100WV M.C. | 1C, 2C |
| C 21, 22 | 0620101 | 100pF 50V P.C. | 2C, 2B |
| C 27, 28 | 0622102 | 1000pF 125V P.C. | 1D, 3D |
| C 604 | 0573339 | 3.3μF 35WV T.C. | 1A |
| C 606 | 0620102 | 1000pF 50V P.C. | 1A |
| C 607 | 0620222 | 2200pF 50V P.C. | 1A |
| C 608 | 0573478 | 0.47μF 35WV T.C. | 1A |
| C 609 | 0573339 | 3.3μF 35WV T.C. | 1A |
| C 611 | 0573339 | 3.3μF 35WV T.C. | 2A |
| C 613 | 0573228 | 0.22μF 35WV T.C. | 2A |
| C 614 | 0602228 | 0.22μF 100WV M.C. | 2A |
| C 615 | 0573229 | 2.2μF 35WV T.C. | 2A |
| C 616 | 0629061 | 6800pF 50V P.C. | 2A |
| C 617 | 0583330 | 33μF 25V E.C. | 2B |
| C 619 | 0573228 | 0.22μF 35WV T.C. | 3B |
| C 620 | 0602228 | 0.22μF 100WV M.C. | 3C |
| C 623, 624 | 0573339 | 3.3μF 35WV T.C. | 3B |
| C 625 | 0511108 | 0.1μF 35WV | 3B |
| L 01 | 4900220 | 100mH Inductor | 3B |
| T 01 | 4240720, 1 | MPX Coil | 2A |
| LF 01, 02 | 0910440 | Low Pass Filter | |
| RL01, 02 | 1150520 | Relay | 1D, 2D |
| VR01 | 1034240 | 3.3kΩ B | 1A |
| VR02 | 1035170 | Volume 47kΩ B | 2A |
| VR03 | 1035170 | Volume 47kΩ B | 3A |
| VR04 | 1035170 | Volume 47kΩ B | 3A |
| VR05 | 1035130 | Volume 10kΩ B | 3B |
| VR06 | 1035210 | Volume 220kΩ B | 1B, 2B |
| S01 | 1110270 | Slide Switch | |

## 4-6. F-2790 Power Supply Circuit Board (Stock No. 7503201)

Conductor Side

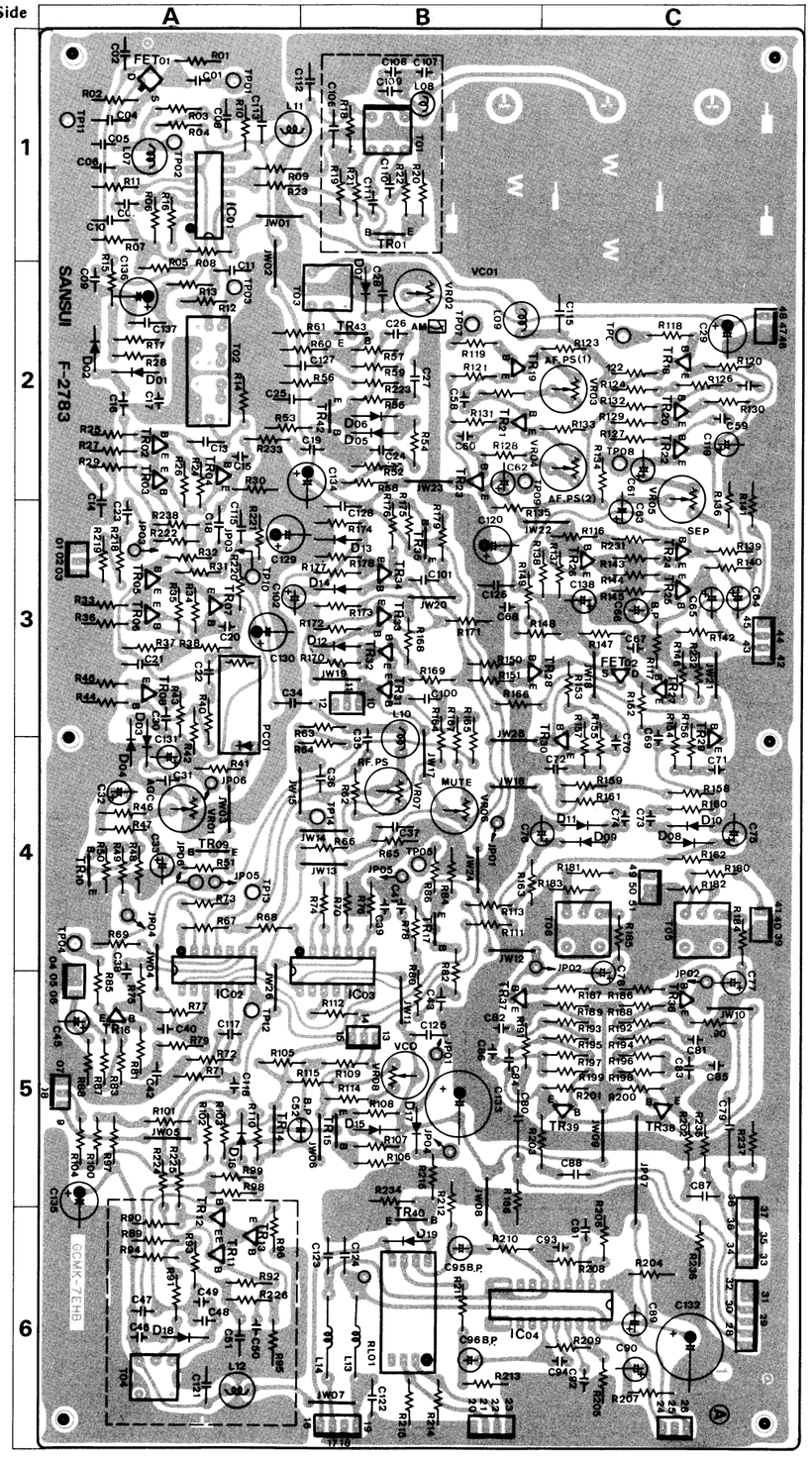



### Parts List

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| •Transistors | | | |
| TR01 | 0308391, 2 | 2SD313AL D, E | 2B |
| TR02 | 0303231, 2 | 2SB507V11-AL D, E | 1B |
| TR03 | 0306550, 1 | 2SC1775 E, F | 2C |
| TR04 | 0300930, 1 | 2SA872 D, E | 1C |
| TR05 | 0306740, 1 | 2SC1845 E, F | 2C |
| TR06 | 0301090, 1 | 2SA992 E, F | 1C |
| TR07 | 0300930, 1 | 2SA872 D, E | 1A |
| •FET | | | |
| FET01 | 0370342, 3 | 2SK163L1, 2 | 1A |
| •Diodes | | | |
| D 01 | 0311700 | RB-152 | 2B |
| D 02, 03 | 0310340 | 10D1 (1S2226) Silver | 2B, 1A |
| D 04 | 0311160 / 0311180 | 1S2473D / 1S1588 | 2C |
| •Zener Diodes | | | |
| ZD01 | 0316390 | RD6.2E B | 1C |
| ZD02 | 0316230 | RD9.1E B | 1A |
| C 01 ~ 04 | 0681010 | 0.01μF 630V M.C. | 2B |
| C 12, 13 | 0622202 | 2000pF 125V P.C. | 2C, 1C |
| C 15, 16 | 0681018 | 0.22μF 250V M.C. | 2C, 1C |
| C 19 | 0587109 | 1μF 80V E.C. | 1A |
| C 20 | 0585479 | 4.7μF 50V E.C. | 1A |
| C 21 | 0622471 | 470pF 125V P.C. | 1A |
| C 35, 36 | 0681013 | 0.033μF 400V F.C. | 2C, 1C |
| R 05, 06 | 0212229 | 2.2Ω 2W N.I.R. | 2B, 1B |
| VR01 | 1035110 | Volume 4.7kΩ B A.V.R. | 1, 2C |
| F 01, 02 | 0432230 | AC Fuse 1.5A 250V | 2A |

## 4-7. F-2783 AM Main Circuit Board (Stock No. 7530401)

Conductor Side



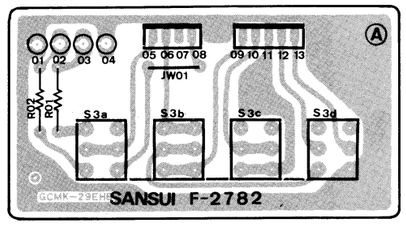
## Parts List <F-2783>

| Parts No. | Stock No. | Description | Position |
|---|---|---|---|
| ●Transistors | | | |
| TR01 ~ 03 | 0306750, 1 | 2SC1359 B, C | 1B.2A |
| TR04 | 0301100, 1 | 2SA838 B, C | 2A |
| TR05, 06 | 0306750, 1 | 2SC1359 B, C | 3A |
| TR07 | 0301100, 1 | 2SA838 B, C | 3A |
| TR08 | 0306750, 1 | 2SC1359 B, C | 3A |
| TR09, 10 | 0306740, 1 | 2SC1845 F, E | 4A |
| TR11 ~ 13 | 0306291 | 2SC1400 (1) U | 6A |
| TR14 | 0306730, 1 | 2SC2259 F, G | 5A |
| TR15 ~ 17 | 0306740, 1 | 2SC1845 F, E | 4B,5A,B |
| TR18, 19 | 0301090, 1 | 2SA992 F, E | 2C.2B |
| TR20 ~ 26 | 0306740, 1 | 2SC1845 F, E | 2B,C,3C |
| TR27, 28 | 0301090, 1 | 2SA992 F, E | 3C |
| TR29, 30 | 0306740, 1 | 2SC1845 F, E | 4C |
| TR31, 32 | 0301090, 1 | 2SA992 F, E | 3B |
| TR33, 34 | 0306740, 1 | 2SC1845 F, E | 3B |
| TR35 | 0301090, 1 | 2SA992 F, E | 3B |
| TR36 | 0306740, 1 | 2SC1845 F, E | 5C |
| TR38 | 0306740, 1 | 2SC1845 F, E | 5C |
| TR40 | 0306740, 1 | 2SC1845 F, E | 6B |
| TR42, 43 | 0306750, 1 | 2SC1359 B, C | 2B |
| IC 01 ~ 03 | 0360790 | LM1496N | 1A,5A,B |
| IC 04 | 0360810 | IC MPC 1190C | 6C |
| ●FET | | | |
| FET01 | 0370120, 1 | 3SK41 K, L | 1A |
| FET02 | 0370342, 3 | 2SK163L1, 2 | 3C |
| ●Diodes | | | |
| D 01 ~ 04 | 0310330, 1 | 1N60 | 2A.4A |
| D 05, 06 | 0311160 / 0311180 | 1S2473D / 1S1588 | 2B |
| D 07 ~ 11 | 0310330, 1 | 1N60 | 2B.4C |
| D 12 ~ 17 | 0311160 / 0311180 | 1S2473D / 1S1588 | 3B,5A,B |
| D 18 | 0340190 | 1SV-53-F3 Varistor | 6A |
| D 19 | 0311160 / 0311180 | 1S2473D / 1S1588 | 6B |
| PC 01 | 0920080 | P873-G35-911 Photo Couplar | 3A |
| C 15 | 0669210 | 10pF 50V C.C. | 2A |
| C 20 | 0661220 | 22pF 50V C.C. | 3A |
| C 33 | 0573338 | 0.33μF 35WV T.C. | 4A |
| C 35, 36 | 0622391 | 390pF 125V P.C. | 4B |
| C 42, 43 | 0622561 | 560pF 125V P.C. | 5A,5B |
| C 46 | 0622102 | 1000pF 125V P.C. | 6A |
| C 47 | 0622682 | 680pF 125V P.C. | 6A |
| C 48 | 0623470 | 47pF 125V P.C. | 6A |
| C 49 | 0669406 | 22pF 50V C.C. | 6A |
| C 60 | 0622561 | 560pF 125V P.C. | 2B |
| C 71, 72 | 0622101 | 100pF 125V P.C. | 4C |
| C 79 | 0602478 | 0.47μF 100WV M.C. | 5C |
| C 87 | 0602108 | 0.1μF 1000WV M.C. | 5C |
| C 89, 90 | 0602109 | 1.0μF 1000WV M.C. | 6C |
| C 93, 94 | 0623220 | 22pF 125V P.C. | 6C |
| C 107 | 0669406 | 22pF 50V C.C. | 1B |
| C 108 | 0622391 | 390pF 125V P.C. | 1B |
| C 109 | 0661220 | 22pF 50V C.C. | 1B |
| L 07 | 4900420 | 220μH | 1A |
| L 08 | 4900140 | 1μH | 1B |
| L 09 | 4900400 | 100μH Inductor | 2B |
| L 10 | 4900430 | 330μH | 4B |
| L 11, 12 | 4900400 | 100μH | 1B.6A |
| L 13, 14 | 4290011 | Peaking Coil | 6B |
| T 01 | 4220720 | O.S.C. Coil | 1B |
| T 02 | 4230670 | IF Coil (455 kHz) | 2A |
| T 03 | 4230500 | IF Coil | 2B |
| T 04 | 4290400 | V.C.O. Coil | 6A |
| T 05 | 0910460 | Filter Coil | 4C |
| RL01 | 1150530 | Relay | 6B |
| VR01 | 1034271 | Volume 10kΩ AGC | 4A |
| VR02 | 1034271 | Volume 10kΩ AM.S Meter | 2B |
| VR03 | 1034261 | Volume 6.8kΩ 1 kHz AF.PS | 2C |
| VR04 | 1034261 | Volume 6.8kΩ 10 kHz AF.PS | 2C |
| VR05 | 1034271 | Volume 10kΩ Separation | 2, 3C |
| VR06 | 1034341 | Volume 150kΩ Muting | 4B |
| VR07 | 1034171 | Volume 220Ω RF. PS | 4B |
| VR08 | 1034271 | Volume 10kΩ AM.T Meter | 5B |
| VC01 | 1200060 | AM Variable Capacitor | 2B |

- **The circuit boards, F-2782, F-2786, F-2788, F-2787, F-2789, F-2792 & F-2791 are not supplied as the assembled, the individual parts on the circuit boards, however are provided for orders.**

## 4-8. F-2782 Switch Circuit Board

**Conductor Side**

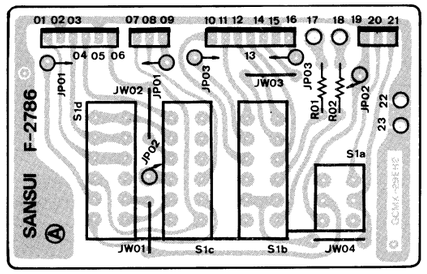



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| | 1131760 | Push Switch, IF Band/Muting |

## 4-9. F-2786 AM Selector R-CH Board

**Conductor Side**

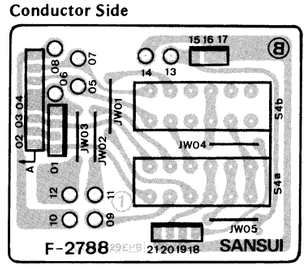



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| | 1131770 | Push Switch, IF Band/Muting |

## 4-10. F-2788 Output-1 Switch Circuit Board

**Conductor Side**

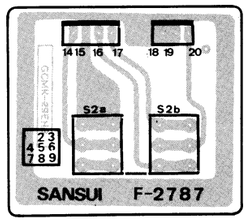



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| | 1131750 | Push Switch AM/FM Selector |

## 4-11. F-2787 Meter Selector Circuit Board

**Conductor Side**

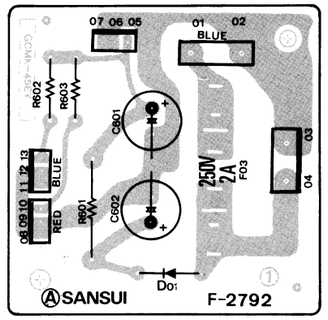



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| | 1131740 | Push Switch, Meter Selector |

## 4-13 . F-2792 Indicator Circuit Board

**Conductor Side**

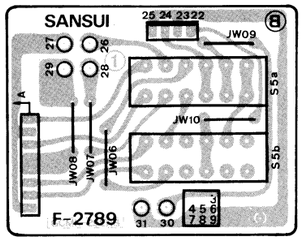



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| ●Diode | | |
| D 01 | 0310340 | 10D1 (1S2226) |
| R 601 | 0212479 | 4.7Ω 2W N.I.R. |
| F 03 | 0431240 | 2A 250V AC Fuse |

## 4-12. F-2789 Output-2 Switch Circuit Board

**Conductor Side**

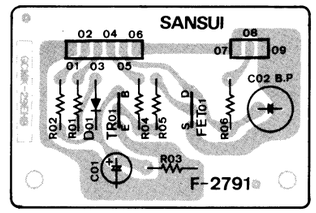



**Parts List**

| Parts No. | Stock No. | Description |
|---|---|---|
| | 1131750 | Push Switch AM/FM Selector |

## 4-14. F-2791 AM Tune Meter Circuit Board

**Conductor Side**




**Parts List**

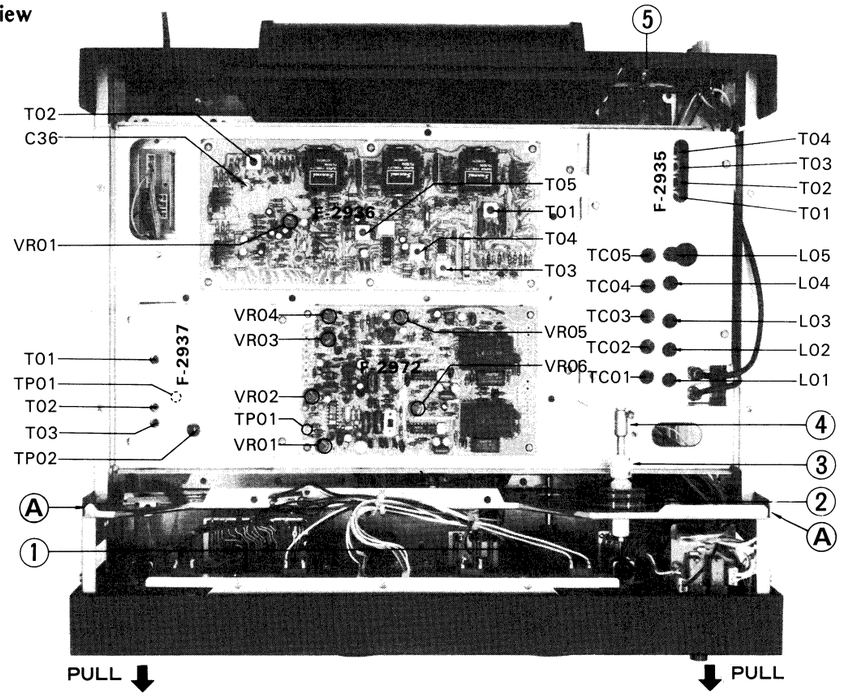
| Parts No. | Stock No. | Description |
|---|---|---|
| ●Transistors | | |
| TR01 | 0306740, 1 | 2SC1845 F, E |
| ●FET | | |
| FET01 | 0370342, 3 | 2SK163 L1, L2 |
| ●Diodes | | |
| D 01 | 0311160 / 0311180 | 1S2473D / 1S1588 |

### ● Abbreviations

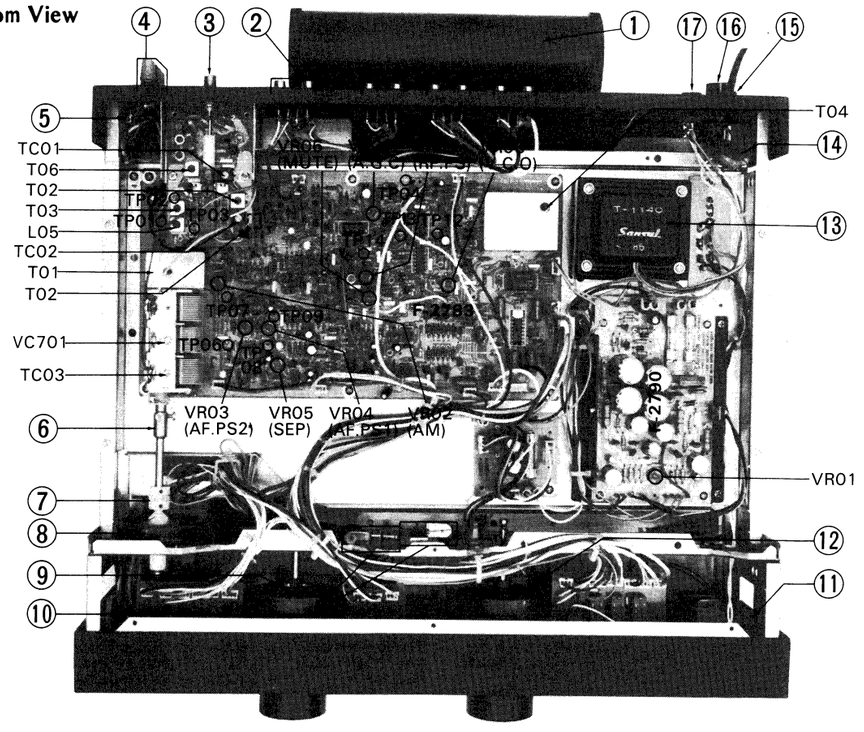
| | | | |
|---|---|---|---|
| C.R. | : Carbon Resistor | E.C. | : Electrolytic Capacitor |
| S.R. | : Solid Resistor | BP.E.C. | : Bi-Polar Electrolytic Capacitor |
| Ce.R. | : Cement Resistor | C C. | : Ceramic Capacitor |
| M.R. | : Metal Film Resistor | Mi.C. | : Mica Capacitor |
| F.R. | : Fusing Resistor | O.C. | : Oil Capacitor |
| N.I.R. | : Non-Inflammable Resistor | P.C. | : Polystyrene Capacitor |
| M.C. | : Mylar Capacitor | T.C. | : Tantalum Capacitor |

# 5. OTHER PARTS

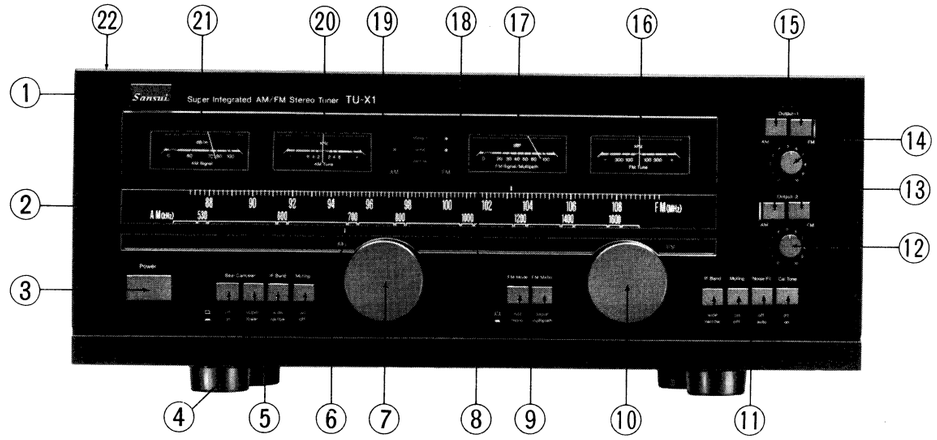
## 5-1. Top View




## 5-2. Bottom View




## 5-3. Front View




**Parts List 〈Top View〉**

| No. | Parts No. | Stock No. | Description |
|---|---|---|---|
| 1 | PL701 ~ 03 | 0400660 | Lamp |
| 2 | | 6146791 | Dial Pulley |
| 3 | | 6046100 | Universal Coupler |
| 4 | | 6046110 | Joint Shaft (FM) |
| | | 2410091 | Voltage Selector Plug |
| | | 2410830 | Voltage Selector Socket |

**Parts List 〈Bottom View〉**

| No. | Parts No. | Stock No. | Description |
|---|---|---|---|
| 1 | | 4200930 | Antenna Coil |
| | | 5026450 | Antenna Box |
| | | 5016080 | Antenna Side Cover |
| 2 | | 2200560 | 2P Input Terminal Board |
| 3 | | 2440040 | Coaxial Connector (with switch) |
| 4 | | 2210360 | 4P Antenna Terminal Board |
| 5 | C 703 | 0620682 | 6800pF 50V P.C. |
| 6 | | 6046120 | Joint Shaft (AM) |
| 7 | | 6046100 | Universal Coupler |
| 8 | | 6146791 | Dial Pulley Unit |
| 9 | | 7036610 | Tuning Unit |
| 10 | | 7136101 | Tension Unit |
| 11 | C 701 | 0659801 | 0.01μF 150V C.C. |
| | | 5616220 | Capacitor Cover |
| 12 | | 7036610 | Tuning Unit |
| 13 | PT 701 | 4002920 | Power Transformer |
| 14 | C 702 | 0659802 | 0.0047μF 125V C.C. |
| | | 5616240 | Capacitor Cover |
| 15 | | 3800470, 1 | AC Cord |
| | | 3910600 | Strain Relief |
| 16 | F 701 | 0431220 | AC Fuse 0.5A, 250V |
| | | 2300060 | Fuse Holder |
| 17 | | 2450060 | AC Outlet |

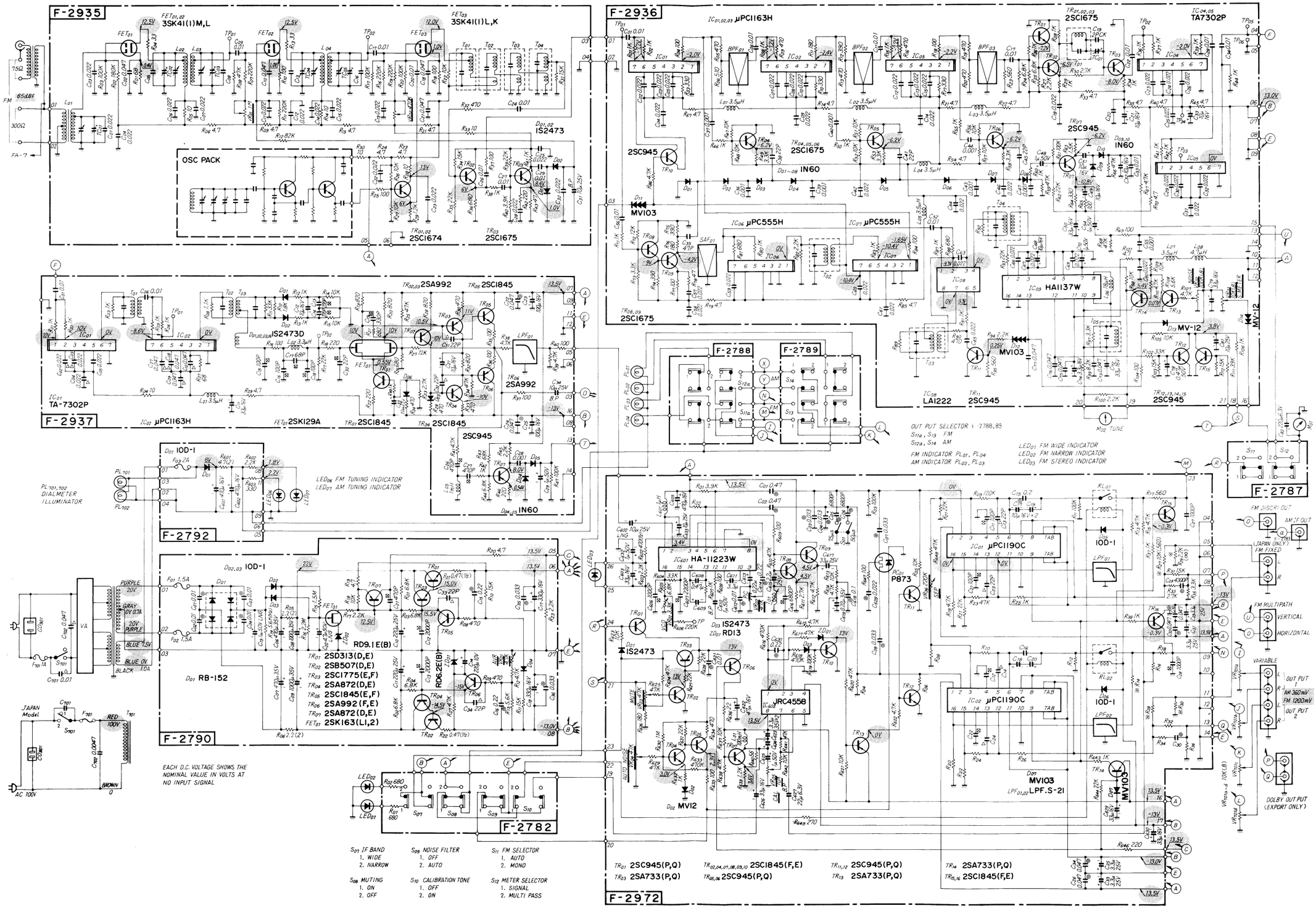
**Parts List 〈Front View〉**

| No. | Parts No. | Stock No. | Description |
|---|---|---|---|
| 1 | | 7008070 | Front Panel Ass'y |
| | | 5446400 | Dial Glass |
| | | 5336600 | Sansui Badge |
| | | 5396600 | 4P Guide Plate |
| | | 5396610 | 2P Guide Plate, output 1, 2 |
| | | 5396570 | 2P Guide Plate, FM mode, meter |
| | | 5396550 | Guide Plate, Power |
| 2 | | 5408600 | Dial Scale |
| 3 | S 701 | 1131230 | Push Switch, power |
| | | 5326740 | Push Button, outer |
| | | 5280330 | Knob Holder, inner |
| 4 | | 5517050 | Leg |
| 5 | | 5326760 | Push Button, outer |
| | | 5280320 | Knob Holder, inner |
| 6 | | 7726250 | Dial Pointer Ass'y (Red AM) |
| 7 | | 5319230 | Tuning Knob, AM |
| | | 7036610 | Tuning Unit |
| 8 | | 7726260 | Dial Pointer (Green FM) |
| 9 | | 5326760 | Push Button (outer) |
| | | 5280320 | Knob Holder (inner) |
| 10 | | 5319230 | Tuning Knob, FM |
| | | 7036610 | Tuning Unit |
| 11 | | 5326760 | Push Button (outer) |
| | | 5280320 | Knob Holder (inner) |
| 12 | VR70 | 1015470 | Volume 5kΩ (B) x 2 output 2 |
| | | 5319220 | Knob, output 2 |
| | | 0400680 | Lamp Ass'y with 4P Connector |
| 13 | PL 70 | 5326760 | Push Button (outer) |
| | | 5280320 | Knob Holder (inner) |
| 14 | VR70 | 1015470 | Volume 5kΩ (B) x 2 output 1 |
| | | 5319220 | Knob, output 1 |
| | | 0400680 | Lamp Ass'y with 4P Connector |
| 15 | PL 70 | 5326760 | Push Button (outer) |
| | | 5280320 | Knob Holder (inner) |
| 16 | M 702 | 4301320 | FM Tune Meter |
| 17 | M 701 | 4301310 | FM Signal Meter |
| 18 | D703 ~ 705 | 0319180 | LED, FM indicator |
| 19 | D701, 702 | 0319170 | LED, AM indicator |
| 20 | | 4301340 | AM Tune Meter |
| 21 | | 4301330 | AM Signal Meter |
| 22 | | 5006830 | Bonnet |

- Design and specifications subject to change without notice for improvement.
- La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
- Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|

# 6. SCHEMATIC DIAGRAM 6-1. FM Section



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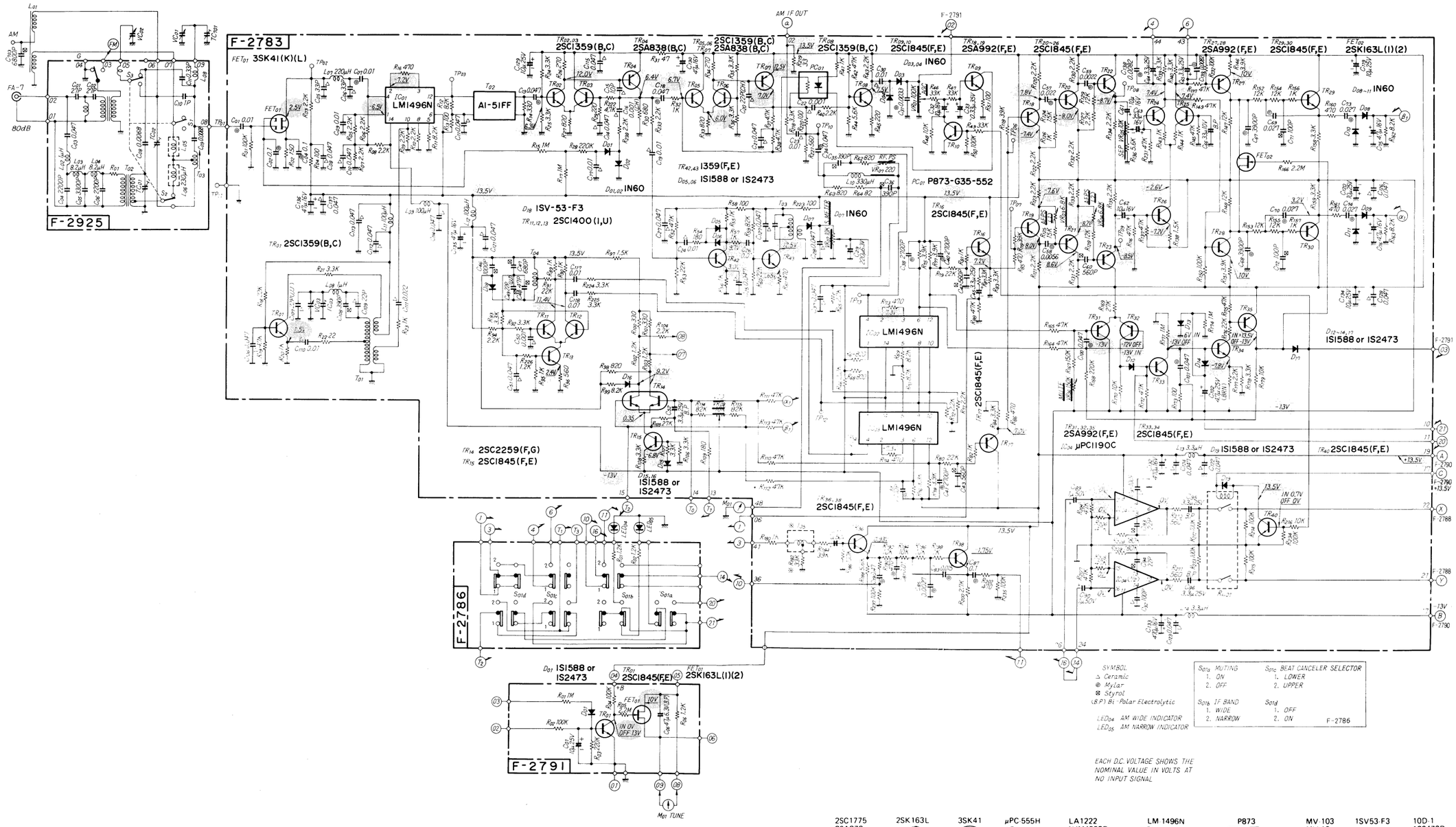
- La présentation et les spécifications sont susceptibles d'éter modifiées sans préavis par suites d'améliorations éventuelles.
- Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|

## 6-2. AM Section

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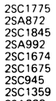

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μPC555H

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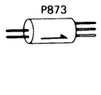
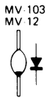
P873



MV103 MV12



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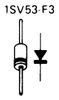

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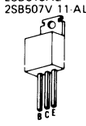
2SD313AL 2SB507V 11-AL



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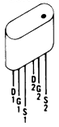

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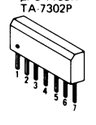
HA-1137W HA-11223

μPC-1163H TA-7302P



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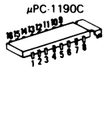
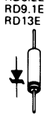
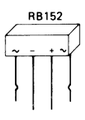


RD6.2E RD9.1E RD13E



RB152



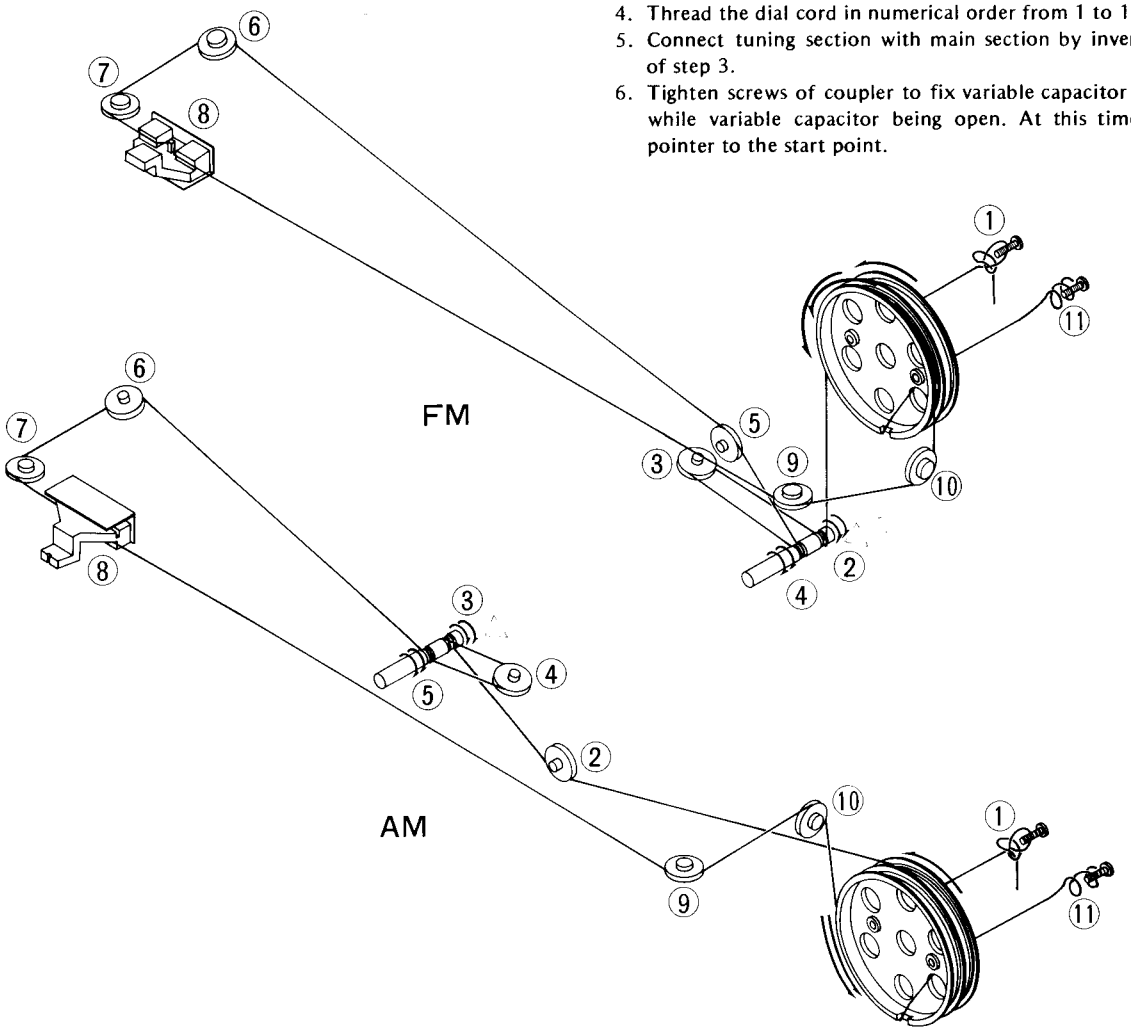
1N60

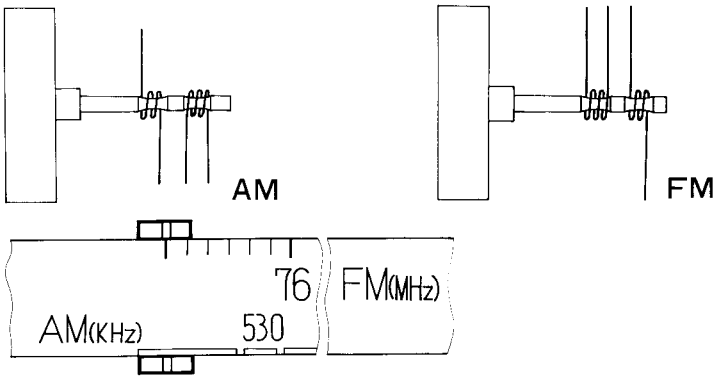
# 7. THREADING OF DIAL CORD

- If a dial cord is cut off or slips, replace it by following procedures. As this unit uses 0.5 mm$\phi$ cord, please replace it with the same type certainly.
- The length of dial cord is approximately 170 cm (68 inch).

## 7-1. Procedure

1. Remove bonnet.
2. Loosen screws of coupler connecting variable capacitor & dial pulley.
3. Separate tuning section from main section to loosen 4 screws A (see top & bottom view on page 13) fixing tuning section to main section.
4. Thread the dial cord in numerical order from 1 to 11 as Fig.
5. Connect tuning section with main section by inverse procedure of step 3.
6. Tighten screws of coupler to fix variable capacitor to dial pulley while variable capacitor being open. At this time, attach dial pointer to the start point.



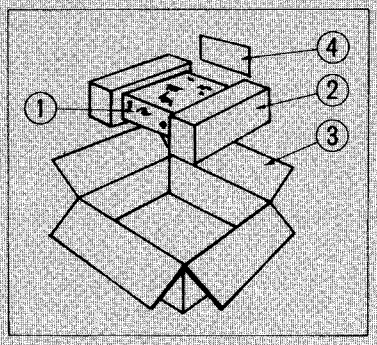




▲Mounting Position of Dial Pointer

* Dial Cord (0.5 mm$\phi$) . . . . . (Stock No. 6036051)

# 8. PACKING LIST

| Parts No. | Stock No. | Description |
|---|---|---|
| 1 | 9116800 | Vinyl Cover |
| 2 | 9028310 | Styrofoam Packing |
| 3 | 9001591 | Carton Case |
| 4 | 9019610 | Corrugated Paper, Protector |




# 9. ACCESSORY PARTS LIST

| Stock No. | Description |
|---|---|
| 9203860 | Operating Instructions |
| 3810280 | PJP Cord |
| 3820120 | FM Antenna |
| 9916229 | Antenna Coupler |
| 2440021 | F Type Connector |
| 9238010 | Schematic Diagram |

Sansui

SANSUI ELECTRONICS CORPORATION: 1250 Valley Brook Ave. Lyndhurst, N.J. 07071 U.S.A.
333 West Alondra Blvd. Gardena, California 90247 U.S.A.
3036 Koapaka St. Honolulu, Hawaii 96819 U.S.A.
SANSUI AUDIO EUROPE N.V.: North Trade Bldg (9th floor) Noorderlaan 133-Bus 1,2030 Antwerp, Belgium
SNASUI AUDIO EUROPE S.A.: Arabella center, 6 Frankfurt AM Main, Lyoner Strasse 44-48, West Germany
SANSUI ELECTRIC COMPANY LTD.: 14-1, Izumi 2-chome, Suginamiku, Tokyo 168 Japan PHONE: (03) 323-1111/TELEX: 232-2076

SM136

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